

Docket No. AUS920030485US1

**CLAIMS:**

What is claimed is:

1. A method in a data processing system for monitoring the execution of a program, the method comprising:
  - associating instructions for calls and returns in the program with a set of indicators; and
  - executing the program using a processor, wherein the set of indicators associated with the instructions causes the processor executing the instructions to generate data on calls and returns in the program.
2. The method of claim 1 further comprising:
  - responsive to identifying an instruction in an instruction cache for execution during execution of the program, determining whether an indicator from the set of indicators is associated with the instruction; and
  - generating an interrupt if the indicator is associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.
3. The method of claim 1, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that records calls and returns.
4. The method of claim 1, wherein execution of an instruction associated with an indicator in the set of

Docket No. AUS920030485US1

indicators causes passing of control to a process that identifies a calling routine.

5. The method of claim 4 further comprising:

associating instructions in the calling routing with the set of indicators; and

executing the program using a processor, wherein the set of indicators associated with the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.

6. The method of claim 1, wherein the set of indicators are located in a shadow memory.

7. The method of claim 1 further comprising:

identifying a called routine.

8. A data processing system for monitoring the execution of a program, the data processing system comprising:

associating means for associating instructions for calls and returns in the program with a set of indicators; and

executing means for executing the program using a processor, wherein the set of indicators associated with the instructions causes the processor executing the instructions to generate data on calls and returns in the program.

Docket No. AUS920030485US1

9. The data processing system of claim 8 further comprising:

determining means, responsive to identifying an instruction in an instruction cache for execution during execution of the program, for determining whether an indicator from the set of indicators is associated with the instruction; and

generating means for generating an interrupt if the indicator is associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.

10. The data processing system of claim 8, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that records calls and returns.

11. The data processing system of claim 8, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that identifies a calling routine.

12. The data processing system of claim 11, wherein the associating means is a first associating means and further comprising:

second associating means for associating instructions in the calling routing with the set of indicators; and

executing means for executing the program using a processor, wherein the set of indicators associated with

Docket No. AUS920030485US1

the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.

13. The data processing system of claim 8, wherein the set of indicators are located in a shadow memory.

14. The data processing system of claim 8 further comprising:

identifying means for identifying a called routine.

15. A computer program product in a computer readable medium for monitoring the execution of a program, the computer program product comprising:

first instructions for associating instructions for calls and returns in the program with a set of indicators; and

second instructions for executing the program using a processor, wherein the set of indicators associated with the instructions causes the processor executing the instructions to generate data on calls and returns in the program.

16. The computer program product of claim 15 further comprising:

third instructions, responsive to identifying an instruction in an instruction cache for execution during execution of the program, for determining whether an indicator from the set of indicators is associated with the instruction; and

Docket No. AUS920030485US1

fourth instructions for generating an interrupt if the indicator is associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.

17. The computer program product of claim 15, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that records calls and returns.

18. The computer program product of claim 15, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that identifies a calling routine.

19. The computer program product of claim 18 further comprising:

fifth instructions for associating instructions in the calling routing with the set of indicators; and

sixth instructions for executing the program using a processor, wherein the set of indicators associated with the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.

20. The computer program product of claim 15, wherein the set of indicators are located in a shadow memory.

Docket No. AUS920030485US1

21. The computer program product of claim 15 further comprising:

seventh instructions for identifying a called routine.